

Extrahepatic Biliary Obstruction Due to Post-Laparoscopic Cholecystectomy Biloma

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ABSTRACT

Background: Jaundice presenting after cholecystectomy may be the initial manifestation of a serious surgical misadventure and requires rigorous diagnostic pursuit and therapeutic intervention. Biloma is a well recognized postcholecystectomy complication that often accompanies biliary ductal injury.

Case Report: A 23-year-old female underwent laparoscopic cholecystectomy for symptomatic gallstones and three weeks postoperatively developed painless jaundice. Radiographic and endoscopic studies revealed a subhepatic biloma causing extrinsic compression and obstruction of the common hepatic duct.

Results: Percutaneous catheter drainage of the biloma combined with endoscopic sphincterotomy successfully relieved the extrahepatic biliary obstruction and resolved the intrahepatic ductal leak responsible for the biloma.

Conclusion: Although heretofore undescribed, post-cholecystectomy jaundice due to extrahepatic bile duct obstruction caused by biloma may occur and can be successfully treated by means of standard radiologic and endoscopic interventions.

Key Words: Cholecystectomy, Biloma, Biliary obstruction, Interventional radiology.

INTRODUCTION

Extrahepatic biliary obstruction following cholecystectomy is a worrisome occurrence that mandates immediate investigation to determine its cause. When choledocholithiasis is found not to be responsible, the etiology is usually a serious iatrogenic injury to the common bile duct, common hepatic duct, or both.^{1,2} Less frequently, the obstruction is due to an obscure and self-limited process, such as inflammatory swelling of the duct.

Bilomas occurring after cholecystectomy are due to major or minor biliary leaks and virtually always imply an operative technical error.³ Most patients with bilomas present with right upper abdominal pain and/or fever, and only rarely do they suffer gastrointestinal obstructive symptoms, such as nausea and emesis. Although bilomas have frequently accompanied biliary ductal injuries, to our knowledge biloma has not been previously reported to cause biliary obstruction by extrinsic compression of the adjacent bile duct.

CASE REPORT

A 23-year-old Hispanic female underwent an apparently uneventful laparoscopic cholecystectomy for symptomatic cholelithiasis. No anatomic abnormalities of the common hepatic duct, common bile duct or cystic duct were noted at operation. Her preoperative liver function tests had been normal. Three weeks postoperatively she noted the onset of painless jaundice. She had no nausea or emesis, but her stools were light in color, and her urine was dark. Liver function tests revealed marked elevations of the total and conjugated bilirubin and alkaline phosphatase suggestive of biliary obstruction. An abdominal computed tomography (CT) scan demonstrated a subhepatic fluid collection in the gallbladder fossa (**Figure 1**). Also noted was mild dilatation of the intrahepatic but not the extrahepatic biliary ductal system. A CT-guided needle aspiration of the subhepatic collection produced bilious fluid, and a percutaneous pigtail drainage catheter placement yielded 200 ml of bile. Two days later, a diagnostic endoscopic retrograde cholangiopancreatography (ERCP) study revealed a tapered narrowing of the common duct with posterior displacement consistent with residual extrinsic mass effect and

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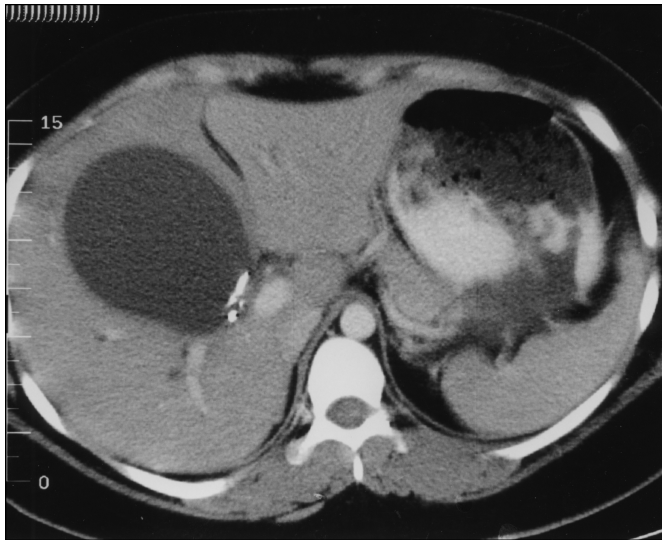


Figure 1. Abdominal CT scan showing subhepatic biloma in the region of the gallbladder fossa.

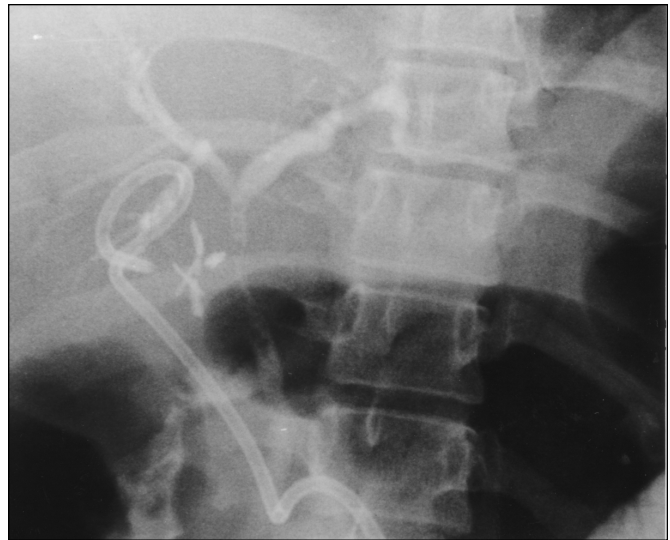


Figure 2. ERCP cholangiogram demonstrating a residual tapered stenosis of the common duct due to compression by the biloma and associated inflammation. Air bubbles introduced during the procedure are present within the bile duct. A percutaneous drainage catheter is seen within the recently decompressed biloma cavity.

associated inflammatory changes (**Figure 2, 3**). Multiple air bubbles were noted to be present within the bile duct that were felt by the endoscopist to have been introduced during the procedure. The metal clips placed at surgery were seen not to be in unusually close proximity to the common hepatic duct. An endoscopic sphincterotomy was performed, and no stones were retrieved from the common duct. Nevertheless, the procedure was complicated by acute pancreatitis of moderate severity that subsided spontaneously over two weeks. The biliary drainage from the percutaneous catheter initially decreased and then remained steady at about 60 ml per day. A catheter fistulagram demonstrated a small right hepatic duct branch in the area of the gallbladder fossa (**Figure 4**). After four weeks of drainage, there was complete resolution of the subhepatic biloma, and a repeat ERCP demonstrated a normal common duct with absence of the narrowing seen on the initial study (**Figure 5**). The intrahepatic ductal dilatation previously noted had also completely resolved. The bile drainage gradually decreased to nil over six weeks, and the percutaneous catheter was removed. Repeat liver function tests at that time had all returned to within normal range. The patient

subsequently was without complaint and has remained well.

DISCUSSION

Both biloma and extrahepatic biliary obstruction are well recognized complications of laparoscopic cholecystectomy. Bilomas typically present as right upper quadrant abdominal pain and may be accompanied by nausea, emesis and fever.^{3,4} They most often are located in the subhepatic space but may occur intrahepatically or, rarely, in the retroperitoneal space.^{4,5} The frequency of biloma as a complication of cholecystectomy has been reported to range from 0.14% to 2.65%.^{4,6} The etiology is most often bile leakage from either an accessory bile duct, a duct of Luschka in the gallbladder fossa of the liver, or an inadequately secured cystic duct stump.³ The diagnosis is supported by an abdominal CT, ultrasound (US) or magnetic resonance imaging (MRI) scan showing a homogenous density fluid collection in the right upper abdomen and can be confirmed by a radionuclide (HIDA) scan demonstrating continuity of the collection with the biliary ductal system.^{4,7-9} ERCP and transhepat-

ic cholangiography are the most accurate techniques for delineating the exact anatomy of the biliary leak.^{3,10,11} Initial management options include percutaneous catheter drainage, ERCP with sphincterotomy and/or biliary stent placement, or a combination of these techniques.^{3,10-12} If initial percutaneous aspiration of the biloma yields a large volume or infected fluid, a drainage catheter should be placed. Some authors recommend an algorithmic approach with percutaneous drainage followed by endoscopic stent placement only for persistent leakage.¹⁰ Others advocate initial endoscopic treatment if no significant abdominal collection is present.¹³ Relaparoscopy has also been advocated based on its ability to cleanse the peritoneal cavity, replace cystic duct clips, electrocoagulate the gallbladder fossa and accurately place drainage catheters.¹⁴ Surgical control of the biliary leak is reserved for cases of failed conservative management or major bile duct injury requiring biliary reconstruction.

Biliary obstruction manifesting after laparoscopic cholecystectomy most often is due to either a retained common duct stone or an unrecognized surgical misadventure, such as transection or clipping of the common

hepatic or common bile duct.^{1,2,15,16} Retained stones may cause postoperative cholangitis or pancreatitis but frequently manifest only as uncomplicated jaundice or elevated liver function tests. As iatrogenic injuries to the biliary tree have similar symptoms, signs and laboratory abnormalities, imaging of the ducts is essential.^{3,15,16} Abdominal US, CT, MRI and HIDA scans all have the ability to detect biliary obstruction, but differentiation between obstructing calculi and bile duct injury may be problematic.⁷ Therefore, ERCP and/or transhepatic cholangiography are usually required for accurate diagnosis of postoperative biliary obstruction.^{3,10} While common duct stones are typically successfully extracted by endoscopic or interventional radiologic means, biliary ductal injuries may or may not be amenable to nonsurgical techniques. Early ductal strictures, partial transections and nonocclusive clips may sometimes be definitively treated by biliary dilatation and stenting, but complete transections or occlusions invariably require surgical reconstruction, usually by means of biliary-enteric anastomosis.^{17,18}

On occasion, partial biliary obstruction appears to be temporary and self-limited, with spontaneous resolution over a period of days to weeks. This may be attributed to localized inflammation or even ductal spasm, although

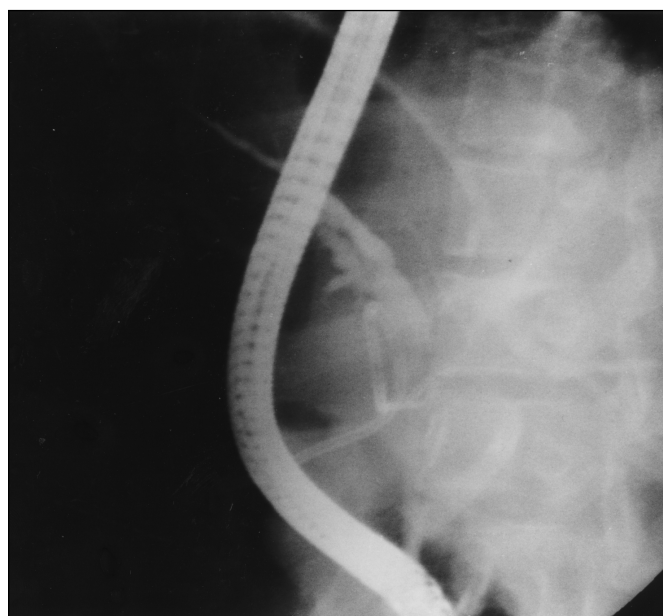


Figure 3. Lateral oblique view of ERCP cholangiogram showing posterior displacement of the common duct consistent with an extrinsic mass effect exerted by the biloma.



Figure 4. Fistulagram through the percutaneous drainage catheter demonstrating a communication between the decompressed biloma cavity and a small branch of the right hepatic duct in the area of the gallbladder fossa.

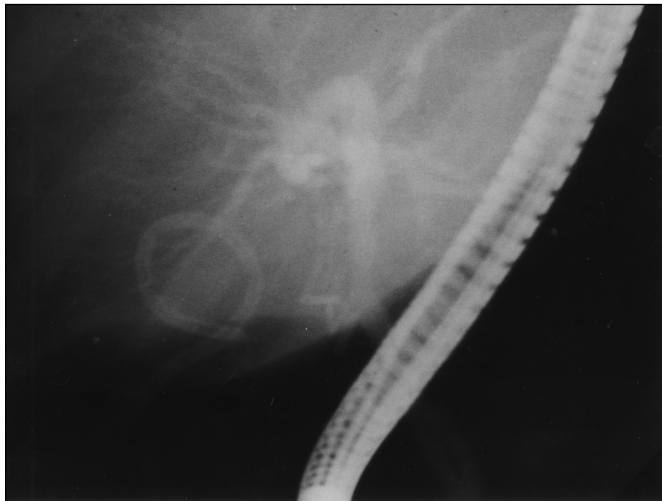


Figure 5. Repeat ERCP cholangiogram showing resolution of the stenosis of the common duct following closure of the biliary fistula and collapse of the biloma cavity.

the etiology usually remains speculative. In the case presented, the specific cause for the partial biliary obstruction was the extrinsic pressure and inflammatory changes imparted by the adjacent biloma. This was manifested on ERCP by the long, smoothly tapered stricture and displacement of the common duct. Decompression of the biloma by percutaneous catheter drainage and treatment of the small intrahepatic ductal leak by sphincterotomy successfully relieved the extrinsic pressure and resulted in resolution of the biliary obstruction.

Although biloma has previously been reported to cause gastric outlet obstruction, this to our knowledge, is the first documented instance of extrahepatic biliary obstruction due to a biloma.¹⁹ Ironically, the pressure exerted on the extrahepatic bile duct by the biloma served to increase the pressure within the more proximal biliary system, thus exacerbating the leakage of bile from the intrahepatic ductal branch and further contributing to the size of the biloma. This may explain the relatively late development of the postoperative jaundice in our patient. The process thus became a self-perpetuating vicious cycle of ductal compression leading to higher biliary pressure leading to increased bile leakage and even greater ductal compression. Decompression of the biloma was probably critical to relieving not only the biliary obstruction per se but also the pressure-head contributing to the perpetuation of the biloma itself. Though obvi-

ously rare, extrahepatic biliary ductal obstruction caused by biloma may follow laparoscopic cholecystectomy and should be recognized as a possible etiology of postoperative jaundice.

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